We claim:

1.   A computerized method for maintaining volume configuration data associated with a

logical volume, the method comprising:

5   setting a volume epoch identifier to an initial value;

          copying the volume epoch identifier to a data structure on each on-line extent

associated with the logical volume; and

          modifying the volume epoch identifier on the data structure on each on-line extent of

the logical volume upon a change to a configuration of the logical volume.

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2.   The computerized method of claim 1, wherein modifying the volume epoch identifier

comprises incrementing a current value of the volume epoch identifier.

3.   The computerized method of claim 1, further comprising:

15   copying the volume epoch identifier to a data structure maintained by a cluster services

component after the volume epoch identifier has been initialized; and

          modifying the volume epoch identifier on the data structure maintained by the cluster

services component upon a change to a configuration of the logical volume.

4.   A computerized method for determining the status of a logical volume configuration,

the method comprising:

reading an epoch value from each extent of the logical volume;

5   comparing the epoch value from each extent of the logical volume; and

determining a configuration status based on the comparison of the epoch value from

each extent of the logical volume.

5.   The computerized method of claim 4, wherein determining a configuration status

10   indicates the logical volume can be exposed when the epoch values from each extent are

equal.

6.   The computerized method of claim 4, wherein determining a configuration status

indicates the logical volume can be exposed when the epoch values from each extent are equal

15   to an epoch valued maintained by a cluster system component.

7.   The computerized method of claim 6, wherein the logical volume comprises a

mirrored volume having at least a first extent and a second extent, and wherein determining a

configuration status indicates the logical volume can be exposed when the epoch value from

20   the first extent matches the epoch value maintained by a cluster system component.

8.   A computerized system comprising:

a computer comprising a processor, a memory, and a computer-readable medium operatively coupled together;

an operating environment executing in the processor from the computer-readable medium;

a logical volume manager operative to control the configuration of at least one disk of a disk storage system, said disk having at least one volume, said volume having at least one extent; and

wherein the logical volume manager maintains on the at least one extent a volume data structure having a volume epoch number and wherein logical volume manager modifies the volume epoch number upon a change in a configuration of the volume.

9.   The computerized system of claim 8, wherein the volume epoch number is modified by incrementing a current value of the volume epoch number.

10.   The computerized system of claim 8, wherein the volume manager determines the status of a volume by comparing the volume epoch numbers on each of the extents of the volume.

11.   The computerized system of claim 8, wherein logical volume manager determines the status of a volume by comparing the volume epoch numbers on each of the extents of the

volume.

12.   The computerized system of claim 8, further comprising a cluster system component

operative to maintain a data structure having a volume epoch number that is modified upon a

5   change to the volume configuration.

13.   The computerized system of claim 12, wherein the logical volume manager determines

the status of a volume configuration by comparing the epoch number on the data structure

maintained on the extent with the epoch number on the data structure maintained by the

10   cluster system component.

14.   A computer-readable medium having computer-executable instructions for performing

a method for managing a configuration of a logical volume, the method comprising:

        setting a volume epoch identifier to an initial value;

15   copying the volume epoch identifier to a data structure on each on-line extent

associated with the logical volume; and

        modifying the volume epoch identifier on the data structure on each on-line extent of

the logical volume upon a change to a configuration of the logical volume.

20   15.   The computer-readable medium of claim 14, wherein modifying the volume epoch

identifier comprises incrementing a current value of the volume epoch identifier.

16.   The computer-readable medium of claim 14, further comprising:

copying the volume epoch identifier to a data structure maintained by a cluster services

component after the volume epoch identifier has been initialized; and

5   modifying the volume epoch identifier on the data structure maintained by the cluster

services component upon a change to a configuration of the logical volume.

17.   A computer-readable medium having computer-executable instructions for performing

a method for determining a status of a logical volume configuration, the method comprising:

10   reading an epoch value from each extent of the logical volume;

comparing the epoch value from each extent of the logical volume; and

determining a configuration status based on the comparison of the epoch value from

each extent of the logical volume.

15   18.   The computer-readable medium of claim 17, wherein determining a configuration

status indicates the logical volume can be exposed when the epoch values from each extent are

equal.

19.   The computer-readable medium of claim 17, wherein determining a configuration

20   status indicates the logical volume can be exposed when the epoch values from each extent are

equal to an epoch valued maintained by a cluster system component.

20.   The computer-readable medium of claim 19, wherein the logical volume comprises a

mirrored volume having at least a first extent and a second extent, and wherein determining a

configuration status indicates the logical volume can be exposed when the epoch value from

5   the first extent matches the epoch value maintained by a cluster system component.